

Chapter 5 Cumulative Impact Assessment

The purpose of this chapter is to assess the MSN Project's potential cumulative impacts to resources that the project may affect, even if project impacts are relatively small.

For this assessment Caltrans and FHWA used the *Guidance for Preparers of Cumulative Impact Assessment*. As recommended in the guidance, Caltrans and FHWA established geographic study areas for the resources under discussion. Where possible, Caltrans and FHWA gathered information to establish trends within the study areas concerning the present state of these resources, including whether a resource is subject to a cumulative impact.

For each resource, Caltrans and FHWA determined whether the Marin Sonoma Narrows would contribute to cumulative impacts associated with a specific resource. Finally general impacts to resources from other past, present, and foreseeable future projects are discussed.

Websites, documents, and other sources of information used for assessing cumulative impacts are identified in the discussion and listed under the reference section of this document.

5.1 Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through different types of effects such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential

community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines, Section 15130, describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under CEQA, can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts, under NEPA, can be found in 40 CFR, Section 1508.7 of the CEQ Regulations.

5.2 Resources Discussed and Geographic Study Areas

The resources discussed in this cumulative impact assessment are water quality, biological resources, wetlands, farmlands, archaeological resources, visual/aesthetics, and air quality. The basis for assessing cumulative impacts depends upon the impact of the MSN Project and other projects within a closely related geographic area.

Since all the waterways located within the project limits (including Novato Creek, Lynch Creek, and San Antonio Creek), are tributaries of the Petaluma River, the Petaluma River watershed has been defined as the geographic study area for aquatic biological resources, wetlands, water quality resources.

The geographic context for salt marsh harvest mouse (SMHM) and California red-legged frog (CRLF) is the extent of the local population range of these species. Since the actual population ranges for these species are unknown, the Petaluma watershed is used to represent the area occupied by these species. While the southern portion of the project area is within the San Pablo Bay watershed, these species are not likely to occur in this area and therefore this watershed has not been included in their geographic context. Each of these species occupy distinct and separate niches and their respective suitable habitat does not exist over the entire watershed.

The geographic context for nesting birds may include trees, shrubs, grasslands, bridges, and some commercial and residential structures throughout the project area.

The geographic context for farmlands is northwestern Marin and southern Sonoma, counties in which it is a highly valued resource.

The geographic context for archaeological resources is the western shorelines of San Pablo Bay since multiple large shellmounds, an important archaeological site, are located between Mount Tamalpais, Mount Burdell and the shoreline.

For visual/aesthetics, the land uses adjacent to the US 101 right of way from the southern MSN Project limits up to Windsor River Road, Sonoma County, has been established as the study area for cumulative impacts.

The geographic context for air quality is the North Bay Area, including the eastern side of Marin County and the Petaluma Valley, as defined by the Bay Area Air Quality Management District. This geographic area includes distinct climatological subregions within the larger Bay Area. Hills to the west of these areas block the flow of marine air.

5.3 Resource Trends

Water Quality

The Petaluma River watershed the Petaluma River Watershed encompasses a 378-km² (146 miles²) area, approximately 30 km (19 miles) long and 21 km (13 miles) wide with the City of Petaluma close to the center. The headwaters and tributaries of the river originate on Sonoma Mountain, Mecham Hill, Weigand's Hill and Mt. Burdell. The confluence of Willow Brook, Liberty Creek, and Weigand's Creek form the headwaters of the Petaluma. The Petaluma River itself flows across the Denman Flat area and through the City of Petaluma. Tidal influence extends upstream of the confluence with Lynch Creek. The lower 19 km (12 miles) of the Petaluma River flow through the Petaluma Marsh, the largest remaining salt marsh in San Pablo Bay. (SSCRCD 2009). The Petaluma River watershed supports beneficial uses for cold and warm freshwater habitat, fish migration, and preservation of rare and endangered species, fish spawning, wildlife habitat, and contact and non-contact recreation. The San Francisco Bay RWQCB Watershed Management Initiative Integrated Plan (October 2004), has described the water quality around the Bay Area. It is also relevant to the water quality in the Petaluma River. "The Bay Area is highly urbanized and is affected by all of the impacts associated with commercial, industrial, and residential development, including wastewater and industrial discharges, historic loss of wetlands through diking and filling, widespread stream modification projects for flood control and urban development, and contamination from pollutants such as industrial

chemicals, hydrocarbons, pesticides, and legacy pollutants such as PCBs and mercury.”

As previously stated in Section 3.2.2 Hydrology and Floodplains, the southern project segment is located in the San Pablo Bay watershed and the Central and Northern Segments are located in the Petaluma River watershed. Several waterways within the MSN Project Area are on the CWA Section 303(d) list of impaired water bodies. These are: Novato Creek, Petaluma River, San Antonio Creek, and San Pablo Bay. Each of these major water bodies already fail to meet the water quality standards of the San Francisco Bay Plan. Therefore, it can be assumed that the Petaluma River and San Pablo Bay watershed are already experiencing cumulative impacts from specific stressors.

Wetlands

United States Army Corps of Engineers (USACE) oversees wetland regulation through its Section 404 Nationwide Program to comply with the Clean Water Act. This permit-driven program implements a no-net-loss policy on Waters of the US (which includes wetlands) and furthermore requires impacts to be compensated based upon prescribed ratios, determined by USACE. Theoretically, fulfillment of permit requirements would tend to improve or sustain the overall health of wetlands and waters of the U.S. The *Status and Trends of Wetlands in the Conterminous United States 1998 to 2004* indicates that, nationally, gains during this period contrast with losses recorded during previous periods since 1950. However, the State, at this time, has no current assessment of no-net-loss for the Petaluma River Watershed and San Pablo Basin Watershed or elsewhere; therefore, precise trends cannot be established. (Josh Collins, San Francisco Estuary Institute, 7/17/06 email; see Table 6-3).

Farmlands

Marin County

According to the Marin Agricultural Land Trust (MALT), there are 80,000 acres of farmland at risk of conversion in western Marin County. These at risk areas are well outside the project area further east of these lands.

Marin’s Countywide Plan states that “Overall milk production (in the county) has held constant since the early 1960s . . . Although the number of Marin dairies has dropped from about 200 in the 1950s to about 30 in 2002, the remaining dairies have larger herds and higher per cow production.” This assessment indicates that

dairy production is not on a downward trend in Marin County. The Countywide Plan also states that 82,157 acres (48.6 percent) of private agriculturally zoned land is under land conservation contracts (e.g., Williamson Act or MALT). This data indicates that farmland is a valued land use that is being successfully conserved in the County.

Sonoma County

In February 1990, Sonoma County voters approved Measures A and C to establish a Agricultural Preservation and Open Space District (District) and a sales tax to fund agricultural preservation and open space acquisition over a 20-year period. In *Preventing Sprawl: Farmers and Environmentalists Working Together*, the Greenbelt Alliance and the Sonoma County Farm Bureau state that “Fifty-nine percent of the county’s land (606,500 acres) is dedicated to agriculture. Of this total, grazing land covers 430,000 acres, and farmland covers 175,000. . . One hundred sixty thousand acres are in Williamson Act contracts. . .”

Archaeology

Although the Petaluma River watershed and the San Pablo Bay margin has been subject to decades of archaeological research, the caliber of such studies remains highly variable and overall comparative consistency is difficult to achieve. Limitations in the previous studies make results of the present investigation especially important. It is possible that intact deposits remain below ground in many other locations, but quantifying the number of intact archaeological sites that remain within the watershed and the San Pablo Bay shoreline is difficult at this time.

Visual/Aesthetics in Highway Foreground

The Sonoma County segment of US 101 has historically been known as the “Redwood Highway,” and Redwoods and other trees and landscaping were planted in Caltrans right-of-way in many portions of the corridor within Sonoma County. Redwoods are not necessarily native to all portions of the US 101 corridor within Sonoma County, and have thrived in some locations and not in others. Within the MSN segment of US 101 a substantial proportion, though not all, of planted redwood trees have exhibited stress and decline. Within the larger Sonoma County corridor many redwood plantings have in contrast thrived, forming an important part of the regional corridor visual identity and image.

Recent, current, and future widening projects have been planned or are underway for much of the US 101 corridor in Marin and Sonoma Counties. In that context, the regional trend is one of broad cumulative change in the corridor landscape toward an increasingly urban, road-dominated character with a corresponding cumulative decline in visual quality as elements of vividness and intactness, such as prominent redwood tree groupings, are eliminated and as land use within the highway visual corridor in general becomes increasingly urban.

Biological Resources

Salt Marsh Harvest Mouse (SMHM)

The salt marsh harvest mouse (*Reithrodontomys raviventris*) (SMHM) relies on dense cover of pickleweed to avoid predation (USFWS 1984). The value of pickleweed increases with depth, density, and degree of intermixing with fat hen (*Atriplex patula*) and alkali heath (*Frankenia salina*) (CDFG 2003). SMHM are seldom found in cordgrass (*Spartina* sp.) or alkali bulrush (*Scirpus maritimus*), and species such as salt grass (*Distichlis spicata*) and brass buttons (*Cotula coronopifolia*) are too low-growing to provide ample cover (USFWS 1984). SMHM, which are partly diurnal, use adjacent upland habitat (i.e. grasslands) during daily or seasonal tidal peaks (USFWS 1984).

The species is in decline throughout its range as a result of loss of habitat resulting from continuous development around San Francisco Bay. Historically, "...salt marsh harvest mice evolved with the creation of San Francisco Bay some 8,000 to 25,000 years ago. During the last two hundred years approximately 79 percent of the tidal marshes of the Bay 144,234 acres (58,370 hectares) to 181,448 acres (73,430 hectares) have been filled, flooded, or converted to other types of vegetation" (Jones and Stokes et al. 1979). "Approximately 32 percent of historical tidal marsh has been converted into diked wetland and is marginal or inappropriate habitat for SMHM. Most of the remaining tidal marshes are fragmented strips situated along outboard dikes and along sloughs often separated from one another by considerable distances" (USFWS 1984).

The SMHM is listed as endangered, both at the federal and state level, and is also listed by the state as a "fully protected" species. These designations under federal and state laws along with drastic range reduction and trends of habitat fragmentation indicate that this species and its habitat are undergoing cumulative impacts.

California Red-Legged Frog (CRLF)

The California red-legged frog (CRLF) (*Rana aurora draytonii*) is the largest native frog found in the western United States. The CRLF requires habitat that consists of both aquatic and riparian elements. Adults use dense, shrubby, or emergent vegetation closely associated with deepwater pools with fringes of cattails and dense stands of overhanging vegetation (USFWS 2002).

CRLF are found primarily in wetlands and streams in the coastal drainages of Central California. The CRLF is federally listed as threatened and is a state species of special concern. The status of CRLF under federal and state provisions indicate it is experiencing cumulative impacts.

The reasons for the decline of CRLF are multifaceted and include predation by the exotic bullfrog (*Rana catesbeiana*) and predatory fishes such as sunfish (*Lepomis* sp.), habitat alteration, the overharvest of frogs in the 19th century, air and water pollution, solar radiation, and pathogens and parasites (Cook 2007).

Fall run Central Valley Chinook Salmon

Chinook salmon (*Oncorhynchus tshawytscha*), also known as king salmon, are the largest species of all Pacific salmon. They are anadromous, living in the sea but reproducing in fresh water, and can travel up to 1,000 mi (1,609 km) to spawn. Chinook salmon range from Santa Barbara to Alaska and spawn in streams that are larger and deeper than those utilized by other salmon species (Pacific States Marine Fisheries Commission 1996).

In the California Central Valley there are four distinct runs of Chinook salmon that are distinguished by the season in which the adults return from the ocean to spawn. These are: fall, late-fall, spring and winter run Chinook salmon (Moyle, 2002). The fall run Central Valley Chinook salmon is a federal species of concern and habitats for Pacific salmon are covered under provisions for Essential Fish Habitat (EFH) by the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA).

Chinook salmon in the Central Valley have been in decline for centuries. Unregulated fisheries, hydraulic mining, logging, levees, and dams caused steep population declines in the 19th century. In the late 20th century, salmon numbers, mostly fall-run Chinook, increased to nearly 500,000 fish per year on average, due to the introduction of hatcheries and special flow releases from dams. These

numbers were higher than previous decades, but still were only approximately 10-25 percent of historic abundance. In 2006, numbers of spawners dropped to about 200,000, despite closure of the fishery. In 2007, the number of spawners fell further to about 90,000 fish, among the lowest numbers experienced in the past 60 years, with expectations of even lower numbers in fall 2008 (approximately <64,000 fish). The decline in recent years is due to a combination of natural ocean fluctuations and human-induced changes in Delta and ocean conditions (Moyle 2008).

Central California Coastal Steelhead (CCCS)

Steelhead (*Oncorhynchus mykiss*) are the anadromous form of the rainbow trout, a salmonid species, which is native to western North America and the Pacific Coast of Asia. In North America, steelhead can be found in Pacific Ocean drainages from southern California to Alaska (CDFG 2002). CCCS is a subspecies of steelhead found in watersheds from the Russian River in Sonoma County, to Soquel Creek in Santa Cruz County, and the San Francisco Bay and San Pablo Bay basins (CDFG 2002).

Reasons for their decline for steelhead are similar to those listed for Chinook salmon above, and include dams, logging, water diversions, decreased water quality and siltation, unregulated fisheries, hydraulic mining, levees.

Southern Distinct Population Segment (DPS) North American Green Sturgeon

The green sturgeon is the most widely distributed member of the sturgeon family (NMFS 2007b) in North America. There are two distinct population segments along the west coast of the U.S. and Canada: the northern and southern DPS North American green sturgeon. The National Marine Fisheries Service's Biological Review Team for green sturgeon has concluded that green sturgeon in the northern DPS are not in danger of extinction now or likely to become endangered in the foreseeable future throughout all of its range. The only spawning population from the southern DPS North American green sturgeon is in the Sacramento River. This DPS has the potential to occur in the project area. The southern DPS was listed as federal threatened effective July 6, 2006 (Federal Register 2006). Critical habitat for this species was proposed on September 8, 2008 (Federal Register 2008).

The green sturgeon is a long lived anadromous species that generally migrate upstream through the San Francisco and San Pablo Bays and into the freshwaters of the Sacramento River between late February and late July (CDFG 2002).

CDFG has estimated that the average population of green sturgeon in the Sacramento-San Joaquin River watershed between the years 1954 and 2001 was approximately 1,500 fish per year but these estimates may not be reliable. Based on salvage information of green sturgeon at the Federal and State Fish Protection facilities in the Delta, the abundance of green sturgeon has apparently declined substantially in recent decades (Federal Register 2006).

Nesting Birds

There is an abundance of potential nesting habitat within the project area. Trees, shrubs, grasslands, bridges, and some commercial and residential structures may provide nesting habitat for many species of birds.

Cliff swallow nests were observed beneath the Novato Creek Bridge structure and the San Antonio Creek Bridge structure along US 101. Similarly, nests were observed beneath the San Antonio Creek Freeway Historic Bridge along San Antonio Road. Several large nests were observed in a stand of eucalyptus trees located on private property adjacent to San Antonio Road. These large nests appeared to be vacant and thus were impossible to identify. Caltrans biologists speculate that they were most likely either raptor nests, such as red-shoulder red hawk or red-tailed hawk, great-blue heron, snowy egret or great egret nests. A snowy egret, great egret and great blue heron rookery is also present along Petaluma Boulevard.

Several unidentified nests were observed in the oak woodlands in Olompali SHP and on property belonging to the Silveira Dairy.

Air Quality

Air quality in the San Francisco Bay Area Basin and in the Marin/Petaluma Valley sub-area has been improving over time due to plans and programs implemented by the Bay Area Air Quality Management District and due to the replacement of older vehicles by newer vehicles that have greater fuel efficiency and lower air emissions. In particular, emissions of ozone precursors (NO_x and ROG) and CO have been trending downward in the San Francisco Bay Area Air Basin since 1975. On-road motor vehicles are the largest contributors to CO,

ROG, and NO_x emissions in the air basin. The implementation of stricter mobile source (both on-road and other) emission standards will continue to decrease vehicle emissions in this air basin. Controls on stationary source solvent evaporation and fugitive emissions will also continue to reduce ROG emissions. Emissions of particulate matter (both PM₁₀ and PM_{2.5}) are projected to continue increasing in the San Francisco Bay Area Air Basin through 2020. This increase is due to growth in emissions from area-wide sources, primarily fugitive dust. Emissions of PM₁₀ and PM_{2.5} from diesel motor vehicles have been decreasing since 1990 even though population and VMT are growing, due to adoption of more stringent emission standards. Based on these efforts, the Bay Area is in attainment of ambient air quality standards for criteria pollutants, except ozone and particulate matter at the state level and ozone at the federal level. (California Air Resources Board, California Almanac of Emissions and Air Quality 2006 Edition).

5.4 Past, Present and Foreseeable Future Projects

Caltrans researched projects in northern Marin and southern Sonoma Counties that underwent environmental review and approval between 2001 and 2006. Caltrans also included other transportation projects in northern Marin and Sonoma County along US 101. Also researched were environmental review documents submitted to Caltrans as a function of Intergovernmental Review provisions under CEQA. Caltrans also consulted planning offices in Marin County and Sonoma County and the cities of Novato and Petaluma and researched records obtained through these offices. Table 5-1 encompasses the projects which have potential impacts to resources analyzed within the defined geographic study areas for this cumulative impacts assessment. Project locations in the study area are indicated in Figures 5-1 and 5-2 which appear after the following table.

5.5 Cumulative Impacts Discussion

Wetlands

Table 5-1 lists approved and foreseeable future actions, some of which would impact wetlands in the project vicinity. As in the case of the MSN Project, other project proposals subject to USACE's review under the CWA Section 404 program would also be subject to avoidance, minimization, and compensatory measures that may offset impacts to wetlands.

Table 5-1 Past, Present, and Foreseeable Future Projects in the Study Area

Key	Project and Location	Project Type	Document Type	Project Status	Shared Resource Impact Areas
City of Novato					
1	Binford Road Storage Facility 8190 Binford Road	Commercial	ND	Under Review by Marin County	<ul style="list-style-type: none"> Wetlands Water Quality
2	Costco Expansion 300 Vintage Way	Commercial	MND	In Construction	<ul style="list-style-type: none"> Unknown (not available)
3	Creekside Office (Novato Creek) 1744-1748 Novato Boulevard	Commercial	ND	Completed Construction	<ul style="list-style-type: none"> Wetlands Archaeology
4	Marion Heights 1750 Marion Avenue	Residential	MND	Completed Construction	<ul style="list-style-type: none"> Wetlands Archaeology
5	New Beginnings Next Key 1399 North Hamilton Parkway	Office/Industrial	MND	In Construction	<ul style="list-style-type: none"> Water Quality
6	Oleander Lane Design Review 801 Oleander Lane	Residential	ND	Approved	<ul style="list-style-type: none"> Wetlands Archaeology Water Quality
7	Olive Court 469 Olive Avenue	Residential	ND	In Construction	<ul style="list-style-type: none"> Wetlands Water Quality
8	San Pablo Subdivision San Pablo Avenue/Hangar Avenue	Residential	MND	Completed Construction	<ul style="list-style-type: none"> Water Quality
9	Somerston Park (Marion Heights) Northside of Marion Avenue between Anna Court and Bryan Drive	Residential	MND	Completed Construction	<ul style="list-style-type: none"> Water Quality
10	Oak Ridge Estates End of Shevelin Road	Residential	EIR	Updating EIR; Waiting on Approval	<ul style="list-style-type: none"> Wetlands Water Quality
11	Whole Foods/Mixed Use 790 Delong Avenue	Mixed Use	MND	In Construction	<ul style="list-style-type: none"> Water Quality Archaeology
12	Woodview Subdivision San Marin Drive/Dorothy Way	Residential	MND	In Construction	<ul style="list-style-type: none"> Wetlands Water Quality

Table 5-1 Past, Present, and Foreseeable Future Projects in the Study Area

Key	Project and Location	Project Type	Document Type	Project Status	Shared Resource Impact Areas
County of Sonoma					
13	Dutra Asphalt & Recycling Facility 3355 Petaluma Blvd. S.	Industrial	IS	Out for Public Comment	<ul style="list-style-type: none"> Wetlands Aesthetics Water Quality Archaeology Steelhead, Chinook Salmon, California Clapper Rail Nesting Habitat
14	Royal Petroleum 2645 & 2525 Petaluma Blvd. South	Commercial	MND	Approved	<ul style="list-style-type: none"> Aesthetics
15	Shamrock 210 & 222 Landing Way	Industrial	MND	Completed Construction	<ul style="list-style-type: none"> Wetlands
16	Novato Disposal 2543 Petaluma Blvd. South	Industrial	MND	Approved	<ul style="list-style-type: none"> Aesthetics
City of Petaluma					
17	Intersection widening and signalization project Adobe Rd/Corona Rd IS	Traffic Improvement	MND	Approved	<ul style="list-style-type: none"> Wetlands Aesthetics
18	Boulevard Apartments 945 Petaluma Boulevard North	Residential	MND	Completed Construction	<ul style="list-style-type: none"> Water Quality
19	Deer Creek Plaza NW side of N. McDowell/Rainier Avenue Intersection	Mixed Use	IS	Process of being revised to new General Plan of Mixed Use	<ul style="list-style-type: none"> Wetlands Water Quality
20	Lafferty Ranch Park 3.5 miles from Petaluma	Recreation	EIR	On Hold	<ul style="list-style-type: none"> Wetlands Water Quality Archaeology
21	Magnolia Place Magnolia Avenue, near Cemetery	Residential	MND	Completed Construction	<ul style="list-style-type: none"> Wetlands Water Quality

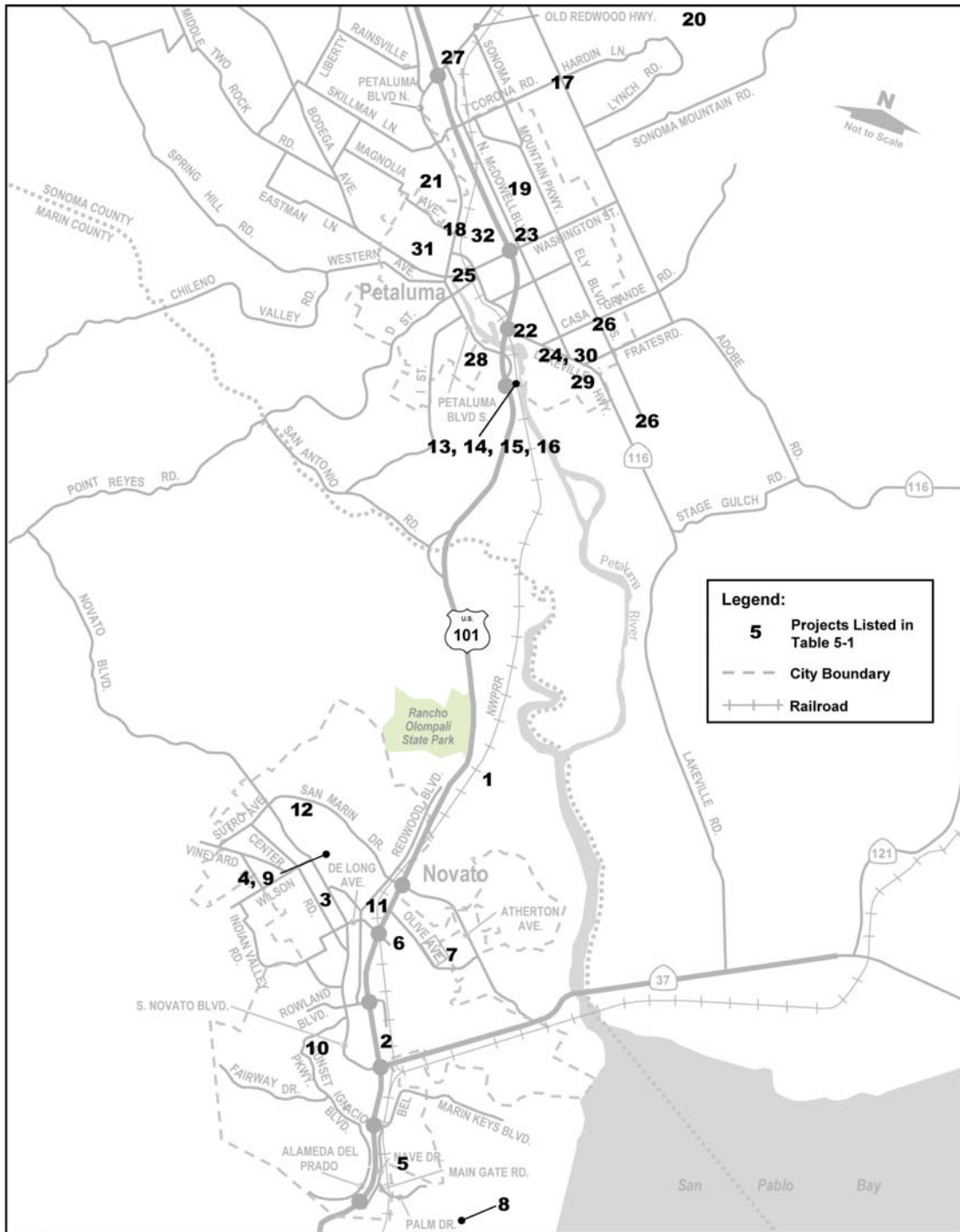
Table 5-1 Past, Present, and Foreseeable Future Projects in the Study Area

Key	Project and Location	Project Type	Document Type	Project Status	Shared Resource Impact Areas
22	Marina Office Building 785 Baywood Drive	Office	MND	Approved	<ul style="list-style-type: none"> Wetlands Water Quality
23	McDowell/E. Washington	Traffic Improvement	MND	Completed	<ul style="list-style-type: none"> Wetlands
24	Park Square Casa Grande Road at Lakeville Highway	Residential & Commercial	MND	Retail portion Under construction. Res. portion Completed	<ul style="list-style-type: none"> Water Quality
25	Petaluma Theater District First and Second Streets at C and D Streets	Residential & Commercial	MND	Approved	<ul style="list-style-type: none"> Archaeology
26	Recycled Water Pipeline Phase I Brown's Lane/Ely Road/Casa Grande Road	Utility	MND	EIR in Process	<ul style="list-style-type: none"> Wetlands Water Quality
27	Redwood Technology Center Old Redwood Highway and W. McDowell Blvd.	Office	EIR	Under Construction	<ul style="list-style-type: none"> Wetlands Water Quality
28	Riverview Subdivision Mission Drive near McNair Avenue	Residential	MND	Under Construction	<ul style="list-style-type: none"> Wetlands Water Quality
29	Sola Business Park 1490 Cader Lane (between Lakeville Hwy and South McDowell)	Office	MND	Completed Construction	<ul style="list-style-type: none"> Water Quality
30	Technology Lane Commercial Center Technology Lane	Office	MND	Construction Completed	<ul style="list-style-type: none"> Wetlands Water Quality
31	Sweed School 331 Keller Street	Residential	MND	Construction Completed	<ul style="list-style-type: none"> Water Quality
32	East Washington Place East Washington Street and Ellis Street	Office/Mixed Use	EIR	In Preparation	<ul style="list-style-type: none"> Aesthetics Water Quality Wetlands
US 101 Projects					
Figure 5-2	East Washington Interchange IP	Transportation	IS/EA	Environmental studies underway	<ul style="list-style-type: none"> Wetlands Water Quality Aesthetics

Table 5-1 Past, Present, and Foreseeable Future Projects in the Study Area

Key	Project and Location	Project Type	Document Type	Project Status	Shared Resource Impact Areas
Figure 5-2	Old Redwood to Rohnert Park Expressway HOV Project	Transportation	EIR/EA	Final environmental document being prepared	<ul style="list-style-type: none"> • Water Quality • Farmlands (temporary) • Aesthetics
Figure 5-2	Wilfred Avenue Interchange and HOV Project	Transportation	MND/EA	Final design	<ul style="list-style-type: none"> • Aesthetics
Figure 5-2	Highway 12 to Steele Lane HOV	Transportation	EIR/EA	Under construction	<ul style="list-style-type: none"> • Aesthetics
Figure 5-2	Steele Lane to Windsor River Road HOV	Transportation	EIR/EA	Final environmental document being prepared	<ul style="list-style-type: none"> • Aesthetics
<p>ND = Negative Declaration MND = Mitigated Negative Declaration</p> <p>EIR = Environmental Impact Report UNK = Unknown</p> <p>Sources: Marin County Development Agency, <i>Propdev 40 Semi-Annual Proposed Development Survey</i>, October 2005. City of Novato Planning Department, November 2005, August 2006, and November 2008. County of Marin, Community Development Agency, Current Planning, November 2008 City of Petaluma Community Development, Planning Division, December 2005 and November 2008. County of Sonoma, Community Development Commission, April 2009.</p>					

330 Figure 5-1 Projects within MSN Cumulative Impacts Assessment Study Area



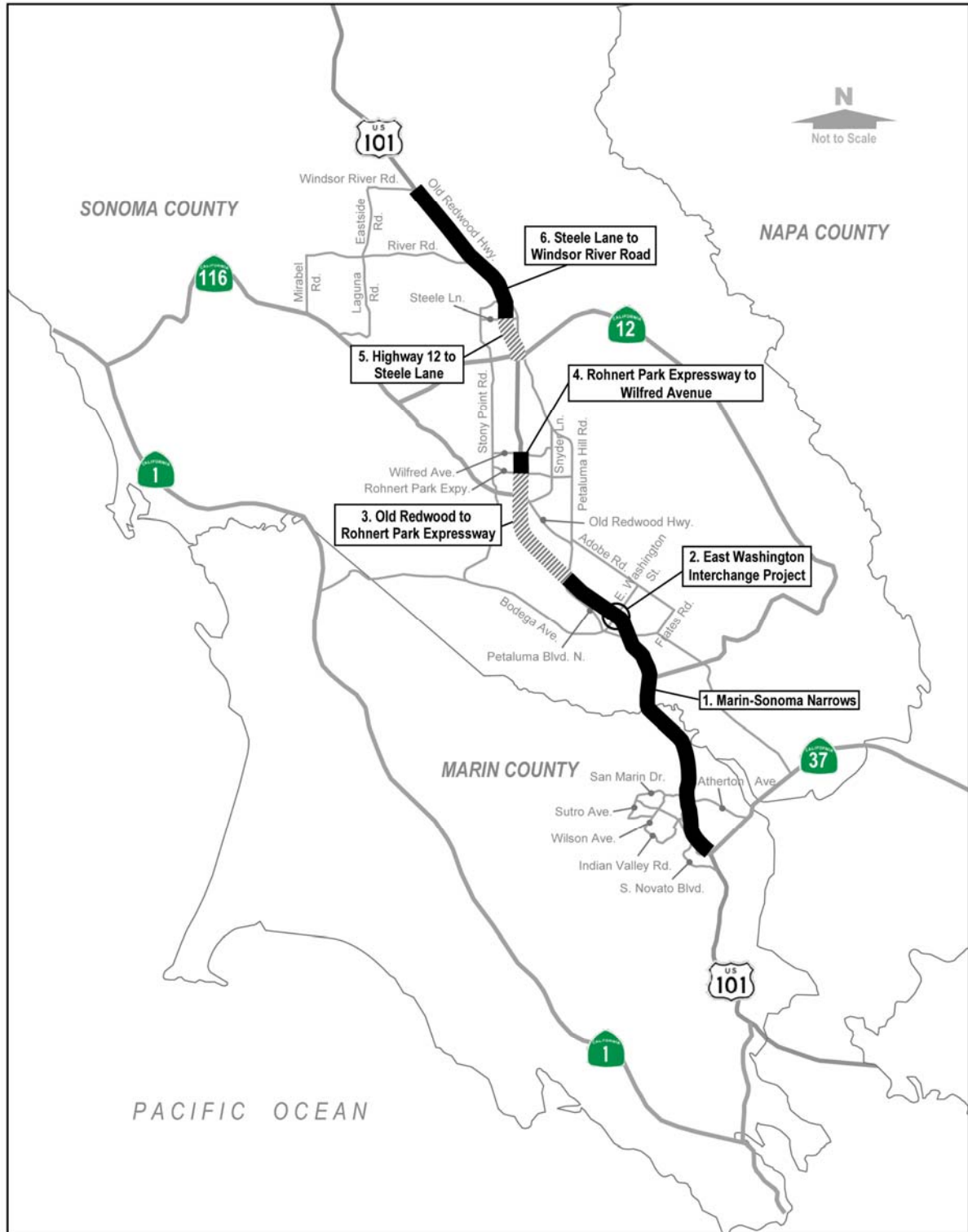
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Note: Not to scale.

332 Figure 5-2 MSN Visual/Aesthetics Cumulative Impacts Assessment Study Area



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Caltrans' wetland compensation related to the MSN Project would be determined in conjunction with state and federal regulatory agencies under the NEPA/404 process (see Section 6.3.1). It is expected, however, that the hectares (ha) (or acres [ac]) realized through compensation would result in a net increase over the amount of wetlands impacted under the Build Alternatives based upon FHWA's nationwide goal for replacing impacted wetlands at 1.5:1. In addition, Caltrans and FHWA would establish successful wetland compensation ahead of construction to compensate for impacts associated with project segments undertaken. Therefore, there would be no temporary impacts. Furthermore, the Build Alternative would not make remaining wetlands in the Central Segment vulnerable to future impacts. This is evidenced by the fact that the MSN Project conforms with local plans (see Section 3.1.2.), which contain policies toward the preservation of natural resources. Consequently, the MSN Project would not contribute toward cumulative wetland impacts.

Water Quality

There are numerous past, present, and foreseeable future residential, commercial, and transportation projects in the MSN Project study area (Table 5-1). These projects have direct and indirect impacts to water resources and water quality that could cumulatively impact downstream water resources. Direct and indirect impacts to water resources and water quality from these projects are similar to those identified for the MSN Project; namely, erosion and sedimentation, the addition of impervious areas that can alter the rate and pollutant characteristics of storm water runoff and discharge or filling of wetlands, and disturbance to Waters of the U.S. The pollutants in individual waterways in the Marin and Sonoma County watershed also migrate into the Petaluma River, San Antonio Creek, and Novato Creek, and eventually into the San Pablo Bay. As noted previously, each of these major water bodies already fail to meet the water quality standards of the San Francisco Bay Plan. Therefore, left unmitigated, the MSN Project could have cumulative water quality impacts in combination with other foreseeable projects.

Like the MSN Project, the majority of the other projects listed in Table 5-1 are subject to an NPDES permit that would require the preparation of Storm water Pollution Prevention Plans and the implementation of Best Management Practices. These plans adhere to permit program requirements developed under the CWA to achieve water quality goals for the major water bodies within the project study area. Also, the environmental documents for these projects indicate

that water quality control strategies would be similar to those recommended for the MSN Project, outlined in Section 3.2.2.

In addition, Caltrans has a statewide NPDES Permit Order No. 99-06-DWQ, which governs the facility after construction. This permit requires Caltrans to implement BMPs, as necessary, to meet water quality standards. If water quality degrades, Caltrans would implement additional BMPs to achieve water quality standards. Consequently, it can be stated that Caltrans does and would continue to manage its facilities to mitigate for cumulative impacts in the Petaluma River and San Pablo Bay watersheds. Therefore, Caltrans' adherence to the RWQCB-approved statewide NPDES program would address cumulative impacts to storm water quality, pollutant loading, and drainage impacts from the MSN Project. Monitoring results and annual reports for the Petaluma River watershed may be viewed at: <http://www.dot.ca.gov/hq/env/stormwater/special/newsetup/index.htm#SWMP>.

Farmlands

Farmland uses are concentrated along the Central Segment of the project limits, where the majority of farmland conversion impacts would occur under the MSN Build Alternative. The hectares (and acres) in Table 5-2 represent the area along nine linear miles that would be impacted due to the MSN Build Alternative.

Table 5-2 Farmland Impacts under the Build Alternative

County	APN#	Williamson Act Contract	Access Alternative 4b	Access Alternative 12b	Access Alternative 14b	Access Alternative 14d
			Hectares (Acres)	Hectares (Acres)	Hectares (Acres)	Hectares (Acres)
Central Segment						
MRN	125-190-001	No	1.01 (2.50)	1.01 (2.50)	1.01 (2.50)	1.01 (2.50)
MRN	125-160-020*	No	10.40 (25.70)	7.24(17.90)	7.23(17.86)	3.76(9.30)
MRN	125-160-019*	No	1.57(3.88)	1.57(3.88)	0.02(0.04)	1.23 (3.03)
MRN	125-160-018*	Yes	5.05(12.48)	3.95(9.77)	3.02(7.46)	5.24 (12.95)
MRN	125-160-016	No	5.18 (12.80)	7.13 (17.62)	4.23 (10.45)	6.50 (16.06)
MRN	125-160-015*	Yes	0.29 (0.72)	1.15 (2.84)	0.03 (0.07)	0.26 (0.64)
MRN	125-160-012*	No	0.51 (1.26)	0.51 (1.26)	0.51 (1.26)	0.51 (1.26)
MRN	125-160-006*	No	1.93 (4.77)	1.93 (4.77)	1.93 (4.77)	1.93 (4.77)
MRN	125-130-035	No	0.45 (1.11)	0.45 (1.11)	0.45 (1.11)	0.45 (1.11)
MRN	125-130-032	No	0.05 (0.12)	0.05 (0.12)	0.05 (0.12)	0.05 (0.12)
MRN	125-130-024*	Yes	1.03 (2.55)	----	0.78 (1.93)	0.97 (2.40)
MRN	125-130-023*	No	4.41 (10.90)	3.72 (9.19)	3.66 (9.04)	10.90(26.93)
MRN	125-130-013	No	0.08 (0.21)	0.08 (0.21)	0.09 (0.21)	0.09 (0.21)
MRN	125-130-014	No	1.30 (3.21)	1.31 (3.23)	1.31 (3.23)	1.31 (3.23)

Table 5-2 Farmland Impacts under the Build Alternative

County	APN#	Williamson Act Contract	Access Alternative 4b	Access Alternative 12b	Access Alternative 14b	Access Alternative 14d
			Hectares (Acres)	Hectares (Acres)	Hectares (Acres)	Hectares (Acres)
MRN	125-130-004*	Yes	0.04 (0.10)	0.36 (0.89)	7.03 (17.36)	7.03 (17.37)
Marin Subtotal			33.29 (82.27)	30.46 (75.27)	31.33 (77.42)	41.24 (101.91)
SON	019-340-001	Yes	0.12 (0.30)	0.51 (1.27)	0.12 (0.30)	0.12 (0.30)
SON	019-330-014	No	0.01 (0.03)	----	0.01 (0.03)	0.01 (0.02)
SON	019-280-008	No	----	----	----	0.00 (0.00)
SON	019-330-011	No	0.04 (0.10)	0.04 (0.10)	0.04 (0.10)	0.04 (0.10)
SON	019-320-003	No	0.14 (0.34)	0.14 (0.34)	0.14 (0.35)	0.14 (0.35)
SON	019-310-021	No	0.16 (0.39)	0.16 (0.39)	0.16 (0.40)	0.16 (0.40)
SON	019-300-012	No	2.03 (5.01)	2.03 (5.01)	2.03 (5.02)	2.03 (5.02)
SON	019-310-012	No	1.59 (3.92)	1.59 (3.92)	1.58 (3.90)	1.58 (3.90)
SON	019-310-005	No	0.72 (1.78)	0.72 (1.78)	0.72 (1.78)	0.72 (1.78)
SON	019-300-018	No	2.32 (5.74)	2.32 (5.74)	2.33 (5.76)	2.33 (5.76)
SON	019-300-017	No	3.72 (9.19)	3.72 (9.19)	3.72 (9.19)	3.72 (9.19)
SON	019-290-001	Yes	2.56 (6.32)	2.56 (6.32)	2.56 (6.33)	2.56 (6.33)
SON	019-280-003	No	3.89 (9.60)	3.89 (9.60)	3.89 (9.61)	3.89 (9.61)
SON	019-280-002	No	0.40 (0.98)	0.40 (0.98)	0.39 (0.96)	0.39 (0.96)
SON	019-280-001	No	2.53 (6.24)	2.53 (6.24)	2.45 (6.05)	2.45 (6.05)
SON	019-220-041	No	0.89 (2.20)	0.89 (2.20)	0.89 (2.20)	0.89 (2.20)
SON	019-330-007	No	0.34 (0.84)	0.33 (0.81)	0.33 (0.81)	0.33 (0.81)
SON	019-320-005	No	1.03 (2.55)	1.03 (2.55)	0.97 (2.40)	0.97 (2.40)
SON	019-320-022	No	0.97 (2.40)	0.97 (2.40)	1.00 (2.47)	1.00 (2.47)
SON	019-320-011	No	0.62 (1.53)	0.62 (1.53)	0.62 (1.53)	0.62 (1.53)
SON	019-320-012	No	0.06 (0.16)	0.07 (0.17)	0.07 (0.16)	0.07 (0.17)
SON	019-320-018	No	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)	0.02 (0.04)
SON	019-320-016	No	6.93 (17.12)	6.93 (17.12)	6.93 (17.12)	6.93 (17.12)
SON	019-220-040	No	1.32 (3.25)	1.32 (3.25)	1.31 (3.25)	1.32 (3.25)
Sonoma Subtotal			32.38(80.00)	32.76 (80.96)	32.27 (79.75)	32.28 (79.77)
Segment B Total			65.67 (162.27)	63.22 (156.23)	63.61 (157.17)	73.52 (181.67)
Northern Segment						
SON	007-380-005	No	0.03 (0.07)	0.03 (0.07)	0.03 (0.07)	0.03 (0.08)
SON	007-380-027	No	0.13 (0.32)	0.13 (0.32)	0.13 (0.32)	0.13 (0.32)
SON	136-010-025	No	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
SON	007-390-005	No	0.00	0.00 (0.01)	0.00 (0.01)	0.00 (0.01)
Segment C Total			0.17 (0.41)	0.17 (0.41)	0.17 (0.41)	0.17 (0.41)
TOTAL			65.84 (162.69)	63.39 (156.64)	63.77 (157.58)	73.69 (182.09)

Source: Parsons Corporation, March 2006.

County of Marin, Countywide Plan Map Viewer website (<http://gisprod1.co.marin.ca.us/CWP/Viewer/bottom/Viewer.asp>).

Sonoma County Tax Assessor's Office, March 2006.

*Represents parcels owned by commercial dairies.

--- No impact.

Marin County

In Marin County, individual land conversions by parcel would range from 0.00 ha (0.01 ac) to 12.98 ha (32.07 ac). The largest land use conversions overall would occur under Access Option 14b (80.09 ha/141.42 ac). The smallest conversion would occur under Access Option 12b (70.87 ha/117.90 ac). However, out of 15 proposed land conversions most would be less than 1.2 ha (3 ac).

Conversions of land owned by commercial dairies would occur under all the Access Options. From smallest to largest they are 29.15 ha (72.02 ac) proposed under 12b; 36.17 ha (89.38 ac) proposed under 14d; 37.86 ha (93.56 ac) under 4b; and 38.68 ha (96.51 ac) proposed under 14b.

It is unknown at this time how much of this land is devoted to grazing and other commercial dairy activities. The remaining land proposed for conversion is residential, county owned, utility facilities, undeveloped lots, or other non-agricultural commercial facilities.

Several of the parcels are identified by Marin County as lands conserved under the Williamson Act. Under the Build Alternative, conversions of Williamson Act lands would take place in amounts of 32.68 ha (80.76 ac), 22.01 (54.4 ac), 34.44 ha (85.09 ac), and 29.66 ha (73.3 ac) under Access Options 4b, 12b, 14b, and 14d, respectively.

In Table 5-1, no other farmland impacts are noted among the past, present, and foreseeable future projects in the resource study area.

Based upon the stability of milk production and the amount of farmland under conservation contracts, the land conversions proposed under the MSN Build Alternatives would not alter the successful conservation trends Marin County is experiencing.

Sonoma County

In Sonoma County, individual land conversions by parcel would range from 0.01 ha (0.03 ac) to 3.89 ha (9.61 ac). The largest combined land use conversions would occur under Access Option 12b (80.39 ha/141.42 ac). However, out of 25 proposed land conversions most would be less than 2 ha (5 ac). Commercial dairy or other farmland activities on these parcels are not currently indicated.

Furthermore, some of the parcels identified in Table 5-2 are located in areas undergoing rapid development. It is unknown whether the Sonoma County Agricultural Preservation and Open Space District has identified any of the parcels in Table 5-2 for conservation. Of the proposed farmland conversions, two of the parcels are under Williamson Act preservation, which represent 2.68 ha (6.62 ac), under Access Options 4b, 14b, and 14d, and 3.07 ha (7.59 ac) under Access Option 12b.

The remaining land proposed for conversion is residential, county owned, utility facilities, undeveloped lots, or other non-agricultural commercial facilities. Within the resource study area, two projects are noted among past, present, and foreseeable future projects listed in Table 5-1. One is the US 101 Old Redwood Highway to Rohnert Park Expressway HOV Widening project, which would have only minor, temporary impacts to farmlands. The other is the Adobe Road/Corona Road intersection widening and signalization project in the city of Petaluma, which is currently on hold.

Land conversions proposed under Access Option 14d, the option that would impact the largest area of farmland, would total 73.69 ha (182.69 ac). This represents less than 0.03 percent of Sonoma County land dedicated to agriculture. Therefore land conversions proposed under the Build Alternative would be minor and would not have negative cumulative effect on farmland conservation efforts in Sonoma County.

Furthermore, the Build Alternative would not make remaining farmland in the Central Segment vulnerable to future impacts. This is evidenced by the MSN Project's conformity with local plans (see Section 3.1.2), which contain policies toward the preservation of farmland and maintaining current low density land uses in the Central Segment. Consequently, the MSN Project would not contribute toward cumulative losses of farmland.

Archaeology

As discussed previously, several archaeological sites have been recorded within the Area of Potential Effect for the MSN Project. The prehistoric constituents of these sites are a contributing element to the sites' National Register eligibility.

The removal of portions of the identified sites as a result of the MSN Build Alternative has an incremental impact on the preservation of archaeological sites

within the Petaluma River watershed and San Pablo Bay vicinity. To determine if there would be cumulative impacts for cultural resources, multiple past, present, and future projects located within the geographic context for this study were considered. Related projects in the area and other development in the county could result in the progressive loss of as-yet unrecorded archaeological resources (see Table 5-1). None of the other projects in Table 5-1 were determined to directly or indirectly create or increase impacts within the project area from ground disturbance (i.e., road building or excavation), activities that would result in cumulatively and considerable impacts. However, cumulative impacts to the archaeological record are unavoidable and are anticipated as a result of the MSN Project and other projects within the project area and vicinity. Consequently, Caltrans and the FHWA have proposed mitigation based upon adverse effects to archaeological resources within the APE found eligible for the National Register. Similar measures may also be implemented for other related projects that have the potential to affect archaeological resources.

Visual Resources

Under CEQA, Cumulative visual impacts could accrue within the US 101 visual foreground in two ways: 1) from visual changes of two or more projects within the same viewshed (in the Northern Segment) combining to create a substantial adverse impact; and 2) within the visual impacts study area (Figure 5-2) from incremental impacts to the overall visual character and quality of the highway corridor by individual projects which, taken alone, may be minor but when taken together represent a substantial change in the corridor's overall visual quality.

As stated previously in Section 3.1.11.1, in its implementation of NEPA, FHWA directs that final decisions regarding projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

Because the basis for evaluating aesthetic impacts under NEPA and CEQA are substantively similar, the following discussion satisfies provisions in both of these laws.

Cumulative impacts could occur within the Northern Segment (City of Petaluma) due to potential visual effects of the East Washington Interchange Project (currently part of the No Build Alternative), which would take place within portions of the same viewshed as the MSN Project. Individual project effects of

the MSN Project, notably removal of prominent tree hedgerows to make way for auxiliary lanes and soundwalls, are anticipated to contribute to similar impacts of the East Washington Project, resulting in substantial adverse cumulative impacts within the immediate project viewshed.

Potential cumulative impacts were also identified in the *US 101 from Steele Lane to Windsor River Road EA/EIR*, due to loss of Redwood trees among the US 101 corridor projects in Sonoma County. Such Redwood groupings are an important component of the visual image of the highway corridor (the “Redwood Highway”) and region. The prevalence of Redwood trees in the US 101 corridor is limited primarily to the area within Sonoma County and northward. The Petaluma portion of the MSN Project represents the southern limit of the area in which Redwoods constitute an important part of the landscape image. The loss of a large number of Redwood trees under the MSN Project would represent a substantial contribution to the cumulative regional loss of Redwood trees in the US 101 foreground visual corridor. This particular cumulative impact is specific to the northern, Petaluma segment of the MSN Project only.

The center widening of the entire corridor could be considered to have a potential cumulative region-wide effect of increasing the urban character of the corridor as a whole. The MSN Project proposes to implement individual project mitigation that would off-set much of that incremental change in corridor visual character, by enhancement of landscape vividness and intactness through re-vegetation and landscaping of the highway visual foreground, particularly in the Marin-Sonoma Narrows, over the long term. Although those measures would help to improve overall corridor visual quality, such measures could not be applied within the Petaluma segment of the MSN Project. In this segment the urbanizing effect of center widening under the MSN Project would be individually moderate, but would contribute to a substantial adverse effect within the geographic study area. In addition, due to the long period to maturation of re-vegetation and landscaping measures (10 to 20 years), substantial short-term cumulative visual impacts are anticipated as a result of the MSN Project in combination with the other US 101 projects.

Biological Resources

Salt Marsh Harvest Mouse (SMHM)

There would be no permanent direct impacts to SMHM habitat as a result of the MSN Project. Caltrans and FHWA will incorporate the measures stated in Section 3.3.6.4 to avoid “take.”¹

As stated in Section 3.3.6.4, there are patches of pickleweed on the east and west sides of the Petaluma River Bridge connected by a channel. Pickleweed on the west is sparse and of very low quality, while the quality of SMHM habitat is higher on the east side where pickleweed is dense and well established. The MSN Project would have permanent impacts to approximately 0.02 ha (0.05 ac) of potential SMHM habitat due to removal of pickleweed prior to construction. After construction, Caltrans and FHWA will revegetate and enhance the pickleweed areas by realigning the channel to maintain connectivity. The new channel will allow greater tidal influence and, thereby, enhance the quality of the pickleweed on the west side of the bridge.

Caltrans and FHWA find that there will be no cumulative impacts to SMHM as none of the projects listed in Table 5-1 indicate potential impacts to SMHM or SMHM habitat. Additionally, the restoration and enhancement measures on the west side of the Petaluma River Bridge after construction will improve the conditions of the pickleweed.

California Red-Legged Frog (CRLF)

Approximately 82.47 ha (203.79 ac) of potential CRLF dispersal habitat will be directly and permanently impacted. Approximately 1.34 ha (3.3.1 ac) of potential CRLF dispersal habitat will be directly and temporarily impacted. The highly disturbed upland areas along the margin of the roadway do not provide high-quality dispersal or foraging habitat due to existing development, the presence of disturbed areas and the paucity of vegetation in many areas. If CRLF occur within the affected areas, the primary use of the affected areas by CRLF would be by individuals dispersing away from breeding areas located within 3.2 km (2.0 mi) of the action area. No breeding habitat will be impacted.

¹Section 9 of the Endangered Species Act defines “take” as: to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt such actions.

Caltrans and FHWA will implement avoidance measures stated in Section 3.3.6.4 during project construction. None of the projects listed in Table 5-1 indicate impacts to CRLF. For the reasons stated above, Caltrans and FHWA find that the MSN Project will not cause cumulative impacts to CRLF.

Central California Coastal Steelhead (CCCS) and Chinook salmon

Approximately 0.47 ha (1.16 ac) of CCCS and Chinook salmon habitat will be directly and permanently impacted in Novato Creek, San Antonio Creek, the Petaluma River and Lynch Creek. The impacts are due to tree removal, the placement of roads and freeway bridge structures, a permanent decrease in shading in the creeks, and the placement of falsework piles, trestle piles, and cofferdams in the creeks for longer than one year.

There are no known CCCS or Chinook salmon spawning sites in the project area, and no CCCS or Chinook salmon juveniles or adults were observed during the field surveys. There is a possibility that migrating adult CCCS could transit through the action area and/or juvenile CCCS or Chinook salmon could disperse and rear within the project area and project construction could affect them. However, with the implementation of avoidance and minimization measures stated in Sections 3.3.5.4 and 3.3.6.4, this is a discountable effect.

Caltrans and FHWA will implement avoidance measures, as stated above, during project construction. None of the projects listed in Table 5-1 indicate impacts to CCCS and Chinook salmon or their habitat. For the reasons stated above, Caltrans and FHWA find that the MSN Project will not cause cumulative impacts to CCCS and Chinook salmon.

Southern Distinct Population Segment (DPS) North American Green Sturgeon

Approximately 0.20 ha (0.49 ac) of green sturgeon habitat will be permanently impacted in the Petaluma River as a result of the replacement of the bridge, a permanent decrease in shading in the river and the placement of falsework piles, trestle piles, and cofferdams in the creeks for longer than one year.

There are no known green sturgeon spawning sites within the project area, and no green sturgeon juveniles or adults were observed during the field surveys. There is a possibility that in the rainy season, adult green sturgeon could transit and/or juvenile green sturgeon could transit and/or rear within the project area within the Petaluma River and project construction activities could affect them. However,

with the implementation of avoidance and minimization measures stated in Section 3.3.6.4, this is a discountable effect.

Caltrans and FHWA will implement avoidance measures stated in Section 3.3.6.4 during project construction. None of the projects listed in Table 5-1 indicate impacts to green sturgeon. For the reasons stated above, Caltrans and FHWA find that the MSN Project will not cause cumulative impacts to green sturgeon.

Nesting Birds

Each of the Access Options would require tree and vegetation removal. Tree removal would vary between 1,401 trees under Access Option 4b and 1,706 trees under Access Option 12b. If no avoidance measures are taken, each of the four Access Options could affect nesting birds. The rookery of great egrets, snowy egrets and great blue herons east of Petaluma Road is directly within the project footprint and this rookery will be impacted.

Caltrans and FHWA will implement avoidance measures stated in Section 3.3.5 during project construction. Dutra Asphalt & Recycling Facility project, listed in Table 5-1, will also impact the rookery east of Petaluma Road. Therefore, there would be immediate direct and cumulative impacts on the rookery from these projects.

Caltrans made modifications under the Preferred Alternative to decrease the radius of the ramp along Petaluma Boulevard in order to minimize impacts to the rookery; however, it was not possible to avoid it completely. Although Caltrans cannot avoid impacts to the rookery, minimization measures will be employed, where feasible, to avoid further impacts from final design and during project construction.

In accordance with the Migratory Bird Treaty Act, the contractor will conduct tree trimming and removal first and foremost outside of the nesting bird season of February 15 through September 1. Trees may be identified for removal during the nesting season only if a qualified biologist has surveyed the trees and confirmed that there are no active nests present within the trees identified for removal or immediately adjacent. If any active nests are identified during this period, the trees cannot be disturbed for the duration of the nesting season. Although it is true that the project will impact a substantial number of trees under the Build Alternatives, many more trees will remain in the project area that can provide

alternative nesting habitat. A tree replacement plan will also be implemented, particularly in Segment B wherever it is feasible, but plantings may take 10-20 years to reach maturity (see Appendix J).

Air Quality

The projects depicted in Figure 5-1 and 5-2 would all contribute air emissions into the San Francisco Bay Area Air Basin and into the smaller cumulative impact study area of east Marin and Petaluma Valley. Although air quality has improved over the years, the area continues to be in non-attainment of the state ozone and PM₁₀ ambient air quality standards and in non-attainment of the federal ozone standard. The approved and pending land development projects, in combination with large transportation improvements that increase capacity, would continue to emit air pollutants that would contribute to cumulative air quality impact without the MSN Project.

The maximum AADT in the segment within the project boundaries with the highest 24-hour volume, would be 128,300 for the No Build Alternative and 135,200 for the Build Alternatives in the year 2030. As discussed in chapter 3.2.6, Air Quality, the Build Alternatives would not be much different from the No Build Alternative in terms of air emissions, for those pollutants for which the Bay Area is in non-attainment. Accordingly, the contribution of the MSN Project would be the same as the cumulative air quality impacts of the other past, present and foreseeable future projects in Table 5-1. However, while AADT and VMT increase over the No Build, the Build Alternatives would alleviate the vehicle hours of delay and the congestion that is particularly acute in Segment B, the Novato Narrows segment, of the project without substantially increasing vehicle miles traveled. As a result, it is reasonable to expect that emissions of carbon and ozone precursors would be reduced compared to No Build conditions. Furthermore, the Build Alternative would also pave the unpaved median outside shoulders, which is notable because one of the largest sources of particulate matter is from resuspended road dust.

As described in Chapter 3.2.6., Air Quality, under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to the SIP for achieving the goals of the Clean Air Act Requirements. Conformity with the Clean Air Act takes place at the regional level and at the

project level. The MSN Project has been found to confirm at both levels (see Section 3.2.6 Air Quality).

Based upon the MSN Project's conformity to the SIP for achieving air quality goals and its consistency with the Transportation Control Measures in the Clean Air Plan, it is reasonable to conclude that the MSN Project would contribute minimally to cumulative air quality impacts in the Bay Area, and even less in the Marin County and Petaluma Valley study area.